ment projects in Washington, Vermont, New York, Minnesota, and Massachusetts have encountered by-products from gasworks.[3] The first Superfund site, discovered in 1980 in Stroudsburg, Pennsylvania, involved deposits of coal tar from a gas plant. In San Francisco, coal tar contamination was discovered during construction of an addition to the U.S. Environmental Protection Agency (EPA) regional headquarters. State and federal regulators are also systematically investigating former gas works sites as potential Superfund sites.

Utilities and Cleanup Costs

Regulators and the utility industry are also devoting increased attention to manufactured gas plant sites owned or operated by the utilities. The utilities are increasingly seeking to compel their insurers to provide indemnity for liability costs[4] or are filing for rate adjustments to recover cleanup costs.[5]

An Illinois jury recently ruled that a utility can recover investigation and cleanup costs for a former manufactured gas site under an environmental impairment liability insurance policy.[6] The jury found that contamination at the site was neither expected nor intended. The question of whether the utility is also entitled to coverage under its comprehensive general liability policies remains pending before the court.

Coal Gasification Process

The coal gasification process consisted of three general operations. Coal was heated in a closed vessel, and gas was removed through a tube. In the condensation phase, the manufactured gas passed through a washbox and condensers to cool the gas to ambient temperature and remove water, tar, and other by-products. The purification process involved cleaning the gas with iron oxide chips or hydrated lime to remove hydrogen sulfide and other impurities. To provide a steady supply of gas, facilities used gas holders for storage. Details of gas production, cleaning, and storage are provided in the following sections.

Gas Production

Coal gas was typically produced by one of three processes: coal carbonization, carbureted water gas, and oil gas. In a typical coal carbonization gas plant, the coal was crushed, placed in a retort, and heated to produce gas and coke. The coal remained in the retort until all of its volatile materials evolved as gas; then the coke was removed, and the retort was charged with fresh coal. The raw gas was purified, stored, and distributed to consumers. Coal gas from the coal carbonization process had a heating value between 500 and 600 BTUs per cubic foot.

Carbureted water gas replaced coal carbonization and became the predominant form of gas production in the United States. The growth of the U.S. petroleum industry after the 1880s and inexpensive supplies of hydrocarbon feedstocks created a manufactured gas industry that was based as much on oil as on coal.[9] Carbureted water gas was produced in a three-stage process. In the first stage, steam was passed over a bed of incandescent coal to produce blue gas, a low-value fuel of approximately 300 BTUs per cubic foot. In the second stage, the hot blue gas was sprayed with hydrocarbons (e.g., naphtha, gas oil, or fuel oil) in a brick chamber carburetor. During the third stage, the oil-enriched blue gas was passed through a superheater, usually a preheated brick chamber, to thermally crack the hydrocarbons and release volatile gases.[10] Carbureted water gas sold to consumers usually had a heating value of between 500 and 600 BTUs per cubic foot, but gases of higher BTU value could be produced.

The coal carbonization and carbureted water gas processes produced gases with different constituents.[11] Gas from the coal carbonization process was primarily a mixture of hydrogen and methane. Carbureted water gas contained less methane, more carbon monoxide, and a higher percentage of illuminants (e.g., ethylene), which made for a brighter-burning fuel.

Gas facilities along the Pacific Coast found it too expensive to ship coal from the east coast, and instead utilized inexpensive supplies of oil from the oil fields in southern California to produce oil gas. The process involved heating a brick generator with air, injecting oil onto the bricks, and collecting the volatile products. Oil gas had a high heating value (1,000 BTUs per cubic foot).

When gas companies switched from manufactured gas (550 BTUs per cubic foot) to natural gas (1,000 BTUs per cubic foot), virtually every gas appliance had to be readjusted for the higher BTU fuel. Early supplies of natural gas were limited and were often insufficient to supply peak demands. Oil gas was the only manufactured gas with sufficient BTU content that could be mixed with natural gas during peak demand periods, and in the waning years of the industry, many of the carbureted water gas facilities were converted to oil gas production.

Gas Condensing and Purifying

After the raw gas left the production apparatus, it passed through a water-sealed hydraulic main or wash box, where it was cooled. Water and the heavier tars condensed in the wash box. Lighter tars were removed in secondary condensers.[12] Aerosols of tar, known as tar fog, often remained in the gas after scrubbing. Large facilities usually used tar extractors to remove the tar fog. Small facilities were more likely to use shavings scrubbers, which were boxes or towers filled with wood shavings, to remove tar aerosols entrained in the gas.

Much of the sulfur that was originally present in the coal or oil was

converted to hydrogen sulfide during gas production. If left in the gas, hydrogen sulfide would cause corrosion in the distribution system and appliances. If allowed to burn, it would form sulfur dioxide, which was damaging to interior furnishings.

Cyanide was also an impurity in gas produced by coal carbonization (500 to 800 ppm), but it was produced in only trace amounts by carbureted water gas and oil gas processes.[13] Because both hydrogen sulfide and hydrogen cyanide are acid gases, processes that removed sulfide generally removed cyanide as well. Large boxes of iron oxide, commonly known as purifiers, were connected in series and the gas stream was directed through the purifier train to remove the hydrogen sulfide and cyanide complexes from the gas.

Gas Storage

Because the production of gas was usually not continuous, a relief holder was used to dampen the gas flow rate changes and to provide a relatively continuous flow to the distribution system. Small gas plants operated equipment only during the day and depended on the gas holder to supply gas when the production equipment was not operating. The larger plants, however, could operate several separate production units, and units were started up or shut down depending on demand for gas.

The first type of relief holder used was the single-lift gas holder, which was an inverted bell in a tank of water.[14] Gas was introduced into the tank from the bottom through the water; the bell would rise when gas was placed into the holder and fall further into the water when gas was removed. Water in the tank formed a seal to hold the gas inside the bell. Some gas holders were constructed that used tar instead of water as a seal, which allowed the gas holders to be used for storage of tar.

The early gas holders were constructed of masonry for the water holder and iron plates for the bell. The water-holding portion of the gas holder was usually placed underground so that the earth would support the walls and reduce construction costs. By the 1920s, the use of masonry was obsolete and tanks were constructed of steel plates. Multiple-lift gas holders that could hold more gas, and waterless gas holders, were also being constructed at this time. In the late 1920s, high-pressure gas tanks were introduced. Unlike the low-pressure single- and multiple-lift holders, the high-pressure tanks had no moving parts and did not require fluids for seals.

Gas Plant Wastes

Ash, coke, and clinkers were produced from heating the coal to provide gas. The coke was recovered for use as fuel. The ash and clinkers were usually disposed of on-site as fill or were given away as construction fill.[15]

Raw tar produced by town gas plants varied from light and water-like tar to heavy tsr—more like roofing tar. The heavier tar generally collected in the

wash box, and the light tar collected in the secondary condensers. The tars were typically burned as boiler fuel or mixed with the carburetor oils for carbureted water gas facilities. In the early twentieth century, applications such as paints and coatings, wood preserving, and road asphalt were developed that later provided commercial value for tars.[16]

In general, tars produced by the carbureted water gas process contained less carbon and pitch and had a higher water content than tars produced by the coal carbonization process. Carbureted water gas tar also contained fewer phenolic compounds, ammonia, cyanide, and nitrogen-containing organics than did coal carbonization facilities.

For carbureted-water gas facilities, the amount of tar produced depended primarily on the oil that was used for the carburetor. The naphtha fraction of petroleum, which boiled at temperatures between the gaseous hydrocarbons and kerosene, was the first carburetion oil used. It produced only a small amount of tar. After World War I, the increased demand for gasoline (produced from the naphtha fraction of petroleum) led gas producers to switch to cheaper petroleum fractions. Gas oil, a petroleum fraction that boiled between kerosene and lubricating oils, was increasingly used. After 1930, the industry used heavy fuel oils for carburetor oil, which increased greatly the amount of tar that was formed.[17]

Carbureted water gas tars frequently formed emulsions when the tars condensed with the steam; recovering tar from the tar-oil-water emulsion was one of the major problems that faced operators of carbureted water gas plants.[18] A tar with a high water content could not be sold and could not be burned. If the tar did not separate from the water in gravity separators, it was usually disposed of, often in on-site tar wells or pits. Emulsions were not a problem with coal carbonization gas plants, because steam was not used in the gas process.

At decommissioned gas plants, tar is the waste that is typically detected in the greatest volume.[19] Tars may be found in underground tanks, piping, lagoons, or remnants of gas holders, or they may have leaked into soils and groundwater.

Light oils produced from the manufactured gas were recovered and sold as a valuable by-product. They were rarely disposed of, but spills or leaks from tanks or piping may have caused some local areas of contamination in the past.[20] Underground oil holders or tanks, which are often found at abandoned gas sites, may contain residues.

Spent oxide, used to remove cyanide and sulfide complexes from manufactured gas, is a large-volume waste that is found at most previous gas sites. Spent oxide wastes had little commercial value and were disposed of as fill around the plant or in dumps.[21] Spent oxide from coal carbonization plants sometimes contained enough cyanide to have an intense blue color, known as Prussian blue. Oxide can also appear yellow or orange.

ENVIRONMENTAL EFFECTS OF THE MANUFACTURED GAS INDUSTRY

A variety of manufacturing and disposal practices contributed to the contamination of gas plant sites. The current state of environmental awareness is more sophisticated, however, and regulations are much more stringent than those that existed during the manufactured gas era.

Waste Disposal Practices

Many gas holders, tar wells, and tar separators had underground portions and were filled with coal tar. Like all underground tanks, given sufficient time, they leaked. One plant operator investigated why certain gas plants appeared to have large amounts of effluent requiring treatment and other gas plants had very little excess process water.[22] His investigation revealed that gas plants with little excess water typically had a leaking gas holder or other underground structure. Water leaking into the ground from the tanks often contaminated local wells and made nearby residences uninhabitable. When the plants were decommissioned, the underground structures containing wastes and debris were rarely removed.

Contamination of soil with gas plant wastes was associated with pollution of local water supply wells and caused odors in the cellars of nearby residences.[23] Production wastes were usually disposed of in dumps at or near the plant site during the period of operation. It was not uncommon for the liquid in gas holders to be released through the overflow pipes and spill on the ground.

Trade association committees were formed to address nuisance complaints against gas works. The trade associations advised their members how to avoid incidents of stream pollution by tar and oil discharges, harm to fish and oysters in streams, damage to paint on boats, objectionable odors, buildup of deposits in sewer systems, interference with municipal sewage treatment facilities, and medicinal aftertastes in chlorinated public drinking water supplies.[24]

The waste disposal methods of one hundred large manufactured-gas companies in the United States were surveyed in 1930.[25] Fifty-seven companies responded to questions regarding production of ammonia; disposal of oil wastes, waste liquors, and spent oxide; and methods of waste treatment before discharge to sewers. Oxide was used as fill or hauled to the dump by the majority of respondents. Oil-containing wastes were pretreated by some companies, but many pumped it into sewers or creeks without treatment or pumped it to the relief holder.

Chemicals of Interest

Gas plant tars and oils are a complex mixture of thousands of chemicals that include aromatic solvents (benzene, ethylbenzene, toluene, xylenes),

aliphatic compounds (paraffins, open-chain hydrocarbons), and polynuclear aromatic hydrocarbons (hundreds of compounds that include naphthalene, fluoranthene, phenanthrene, chrysene, and benzo[a]pyrene). The relative proportions of individual compounds in tar and oil depend on the gasification temperature and process.

Only a small number (approximately fifty) of the large group of chemicals present in coal tar and oil are included on the Target Compound List of chemicals routinely analyzed during hazardous waste investigations at Superfund waste sites. As a result, the analytical procedures themselves limit the number of chemicals that will be investigated at a former gas plant site.

Spent oxides, used for purifying manufactured gas, are heterogenous materials. The most significant contaminants in spent oxide waste are cyanides, arsenic, and sulfur compounds.

Environmental Fate and Transport

The mobility of individual tar and oil compounds in the environment and the degree to which they are likely to contaminate off-site properties is governed by the compound's chemical and physical properties. These properties include water solubility, its propensity to bind to soil (organic carbon partition coefficient or K_{oc}), and its volatility or potential to evaporate (vapor pressure).

Compounds that evaporate easily can migrate upwards through the soil and eventually escape to the atmosphere. The chemicals that easily dissolve in water can be transported off-site in groundwater. Insoluble tar constituents are more likely to attach to soil particles and remain in place. Because of their varying chemical and physical properties, the contaminants migrate through the soil or in groundwater at different rates. As a result, certain mobile compounds, such as toluene and naphthalene, are more likely to be detected at the outer edge of contamination and at a greater distance from the site. The less mobile compounds, such as chrysene and benzo[a]pyrene, are more likely to remain at the original place that they were dumped. The chemical and physical properties of selected chemical constituents are presented in Table 1.[26]

Volatile organic compounds

Volatile organic compounds (VOCs) such as benzene, toluene, xylene, and ethylbenzene are found in oils and light tars. These compounds have fairly high vapor pressures. As a result, they evaporate rapidly from exposed soils and wastes and are typically not found in surface soil or surface water.

VOCs are more typically detected in groundwater. The compounds are easily leached from soil and tend to migrate downwards toward the groundwater, as indicated by low octanol-water partition coefficients (K_{ow}),

TABLE 1
Physical and Chemical Properties of Selected Chemicals of Interest

Chemical	Molecular Weight	Number of Carbon Rings	Vapor Pressure (torr)	Water Solubility (mg/l)	Log K_{ow}	Log K_{oc}
Volatile Organic Compounds						
Benzene	78	1	95	1,791	2.1	2.0
Ethylbenzene	106	1	10	160	3.1	2.4
Toluene	92	1	28	515	2.8	2.5
Xylenes (mixed isomers)	106	1	7-9	160-175	3.1	2.3
Phenols						
Phenol	94	1	0.5	87,000	1.5	1.5
2-Methylphenol	108	1	0.3	30,000	1.9	1.3
4-Methylphenol	108	1	0.1	22,000	1.9	1.7
2,4-Dimethylphenol	122	1	0.09	6,200	2.3	2.6
Polycyclic Aromatic Hydrocarbons						
Naphthalene	128	2	8E-02	32	3.3	2.9
Acenaphthylene	154	3	3E-02	3.9	4.1	3.4
Acenaphthene	154	3	2E-03	3.9	4.0	3.7
Fluorene	166	3	7E-04	1.7	4.2	3.9
Phenanthrene	178	3	1E-03	1.3	4.4	4.1
Anthracene	178	3	2E-05	NA	4.4	4.1
Fluoranthene	202	4	5E-06	NA	4.9	4.6
Pyrene	202	4	3E-06	0.2	4.9	4.6
Benzo(a)anthracene	228	4	3E-08	0.01	5.6	5.3
Chrysene	228	4	6E-09	0.002	5.6	5.3
Benzo(b)fluoranthene	252	5	1E-07	0.01	6.1	5.7
Benzo(k)fluoranthene	252	5	5E-07	NA	6.1	5.7
Benzo(a)pyrene	252	5	6E-09	0.004	6.2	6.7
Benzo(g,h,i)perylene	276	6	1E-10	NA	6.5	6.2
Indeno(1,2,3-cd)pyrene	276	6	1E-10	NA	6.5	6.2
Dibenzo(a,h)anthracene	278	6	1E-10	0.0005	6.8	6.5

ranging from 2.13 to 3.15, and low K_{oc}, ranging from 1.8 to 2.48. VOCs are soluble in water and will be transported horizontally in groundwater aquifers. They are less dense than water and tend to float on top of the aquifer.

VOCs are highly mobile in the environment. As a result, they are good indicators for groundwater of how far wastes have migrated from the original source of contamination.

Phenols

The phenolic compounds (e.g., phenol, 2-methylphenol, 4-methylphenol, and 2,4-dimethylphenol) are typically found in coal carbonization tars and wastewater and less frequently in carbureted water gas wastes. Evaporation of phenols is not rapid from exposed soil and water. These compounds have low vapor pressures, .09-.52 mm Hg, and are found in surface soils and in wastes.

The phenols are easily leached from soil and migrate downwards toward the groundwater, as indicated by their low K_{ow} (1.46-2.30), and low K_{oc} (1.15). They are soluble in water (solubilities range from twenty-three to 87,000 mg/liter) and transported horizontally in groundwater aquifers. The phenols are fairly mobile in the environment.

Polycyclic aromatic hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) are found primarily in coal tar and ashes. PAHs are more dense than water and tend to sink toward the bottom of groundwater aquifers. However, PAHs have widely varying volatilities, soil binding characteristics, and water solubilities. For example, naphthalene is more soluble in water than is chrysene (32 mg/liter and 0.002 mg/liter, respectively), and chrysene has a greater tendency to bind to soils than does naphthalene, as exhibited by its larger log K_{oc} (5.3 and 2.9, respectively). Naphthalene (vapor pressure = .082 mm Hg) has a greater tendency to volatilize than does chrysene (vapor pressure = 6.4×10^{-9} mm Hg).

PAHs with high water solubility and low tendency to adsorb to soils also have lower molecular weights and smaller numbers of benzene rings. These lower molecular weight PAHs (with two or three benzene rings) tend to be more mobile in the environment than higher molecular weight PAHs with four, five, and six rings. As a result, naphthalene, phenanthrene, and acenaphthylene are more likely to be detected in groundwater and migrate off site than chrysene, benzo(a)pyrene, or benzo(g,h,i)perylene. The latter compounds are more likely to be detected where they were originally dumped.

Spent iron oxide

The metal, sulfide, and cyanide complexes in spent oxide are relatively immobile in the environment. These compounds tend to remain at the site of disposal and present minimal risk of off-site transport."

SITE REMEDIATION

The variety of by-products and contaminants and the range of production and disposal practices that may have occurred at former gas plant sites indicate that patterns of contamination can be complex. The strategy for

remediating hazardous waste sites is relatively straightforward, even though the technical issues can be somewhat daunting. A preliminary assessment of the situation is performed to gather all available information. The information is evaluated to identify missing data (e.g., the volume of contaminated soils and the types of contaminants) required to characterize the situation fully. A field investigation (e.g., soil sampling) is performed to resolve the data gaps. The field data are then evaluated to design and construct an appropriate remedy (e.g., soil treatment). Site investigation techniques employed for hazardous waste sites are broadly applicable to former manufactured gas sites. These techniques are well-described in a variety of guidance documents.[28]

Preliminary Assessment

Special considerations are necessary, however, to focus investigations and fully address features characteristic of decommissioned manufactured gas facilities. For example, tars and oils are often contained in underground tanks and pipes that were covered over and abandoned when gas plants were decommissioned. It was not uncommon for the tar and oil in gas holders to be released through the overflow pipes and spill on the ground. Scrubber and purifier wastes were usually disposed of in dumps at or near the plant site during the period of operation. Lagoons and dry wells were often used to dispose of tar-water emulsions that could not be sold. Detailed knowledge of the production practices at the site can provide considerable insight into the potential pattern of contamination.[29]

A preliminary assessment of the site should be performed to determine the potential scope and breadth of future investigations and remediation. Any technical or legal strategy developed at this point in the project must also anticipate where the project may be in the future. The project strategies must show an awareness of the remediation end points: which contaminants are likely to be of concern, their potential cleanup requirements, the regulatory agency's expectations, legal or liability issues that must be resolved, and the data needed to resolve all of these issues. Clarifying these technical issues allows the attorneys and in-house personnel to establish strategic limits in settlement negotiations with regulators.

Aerial photographs and Sanborn Fire Insurance Maps can be used to locate specific plant operations and storage piles of waste materials. At properties currently owned and used by a utility, it is likely that company files may contain old blueprints and site diagrams that can provide specifics of the former manufactured gas plant processes. The locations of active and inactive sewers, water pipes, and electric lines should also be carefully investigated, as underground utilities often create pathways for migration of wastes that would otherwise be relatively immobile. For example, the gravel bedding around utility lines can be a preferential migration pathway in an area with impermeable clay soils.

Site Investigations

The critical first step is to retain a good environmental contractor to represent the responsible party's interests. The best expertise that can be afforded should be hired; this is not the time to accept a low bid without question. Firms that do not have the necessary expertise for performing manufactured gas site studies cause unnecessary delays, submit deficient reports that require long reviews by the regulators and costly rewrites, perform inadequate field work that may have to be done over, and do not select cost-effective cleanup strategies.

If the regulators have the strongest technical voice, their desires, no matter how grandiose, may be incorporated into the cleanup. For example, the Superfund program suffers from a shortage of experienced environmental professionals, yet it has been given enormous responsibilities in a high-pressure environment that demands quick solutions to new and complex technical problems. Thus, the common tendency among inexperienced regulators and project managers is for extreme caution and fairly rigid adherence to proven approaches. Conventional remedial approaches tend to be expensive solutions.

A detailed work plan should be prepared that documents the bounds of the project, the exact data that will be collected, the sampling and analytical methods, and most important, the goals of the investigation. The work plan establishes a common ground between the various parties regarding the scope of the project. In many projects, the work plan becomes the major point of reference for subsequent phases of the project and can be used to settle technical disputes between the responsible party, contractor, and regulatory officials.

Surveillance of the site using relatively nonintrusive surface techniques such as geophysics, soil gas surveys, and hydropunches can provide an indication of the extent of contamination at the site before expensive equipment and manpower are mobilized. Nonintrusive reconnaissance of the site is considerably cheaper than reconnaissance by excavation and could comprise part of a more efficient and focused investigation. Multiple survey techniques are recommended and should be chosen based on the characteristics of the site.

The results of the site surveys are used to refine the sampling plan and to find optimum locations for monitoring wells and soil borings. Monitoring well installation, soil borings, and fixed laboratory analyses can be expensive; hit-or-miss drilling and boring should be minimized. Investigators should also remember that the constituents of tar and oil have variable densities, resulting in complex migration patterns in the vadose zone and aquifers (e.g., dissolved and immiscible phase contaminants composed of

both floating and sinking constituents). Multiple-level sampling using well clusters may be necessary to characterize the vertical extent of aquifer contamination.

The ultimate objective of the site investigation is to ensure that sufficient information is collected to evaluate alternative remedies and to select the most appropriate site remedy. The site investigation does not have the goal of removing all uncertainty regarding the site. Too often, the regulators in charge of the site try to do just that—remove all uncertainty. Regulators will always ask for additional monitoring wells or additional soil samples. Do not be afraid to resist unjustified data requests. Most investigations fall into the trap of collecting just a little bit more data to try to define more accurately the extent of contamination at a particular location. Excessive data collection is a very expensive spiral.

Site Restoration

Because of the millions of dollars of financial liabilities that are presented by the remediation of manufactured gas sites, responsible parties must consider and select cost-effective cleanup remedies that adequately protect human health and the environment. Therefore, the responsible parties must also ensure that data required to support the selection of preferred remedies are collected and properly evaluated. Too often it becomes apparent as the site investigation proceeds that the data collected are of little use, but essential information that was needed to justify a particular remedial action was missed.

One of the biggest areas of contention among responsible parties, regulatory agencies, communities, and Congress regarding the remediation of hazardous waste sites is determining how clean is clean. There can be considerable variability in target cleanup criteria from site to site. After cleanup standards are negotiated, potential remedies for the site can be evaluated. The exact magnitude and volume of contamination at the site may not be known during the early stages of the investigation, but there will be sufficient information to begin evaluating remedial technologies.

Specific processes must be used for different types of wastes and site conditions. For example, large fill areas containing purifier and scrubber wastes with moderate levels of contamination are poor candidates for excavation—the costs would be enormous. A containment technology, such as capping the site or chemical fixation, might be appropriate.

Subsurface tar and oil contamination can extend considerable depths into the subsurface. For these sites, excavation of soil is not feasible, and in situ bioremediation or containment would be a good candidate remedy. A site with discrete shallow hot spots of tar contamination, however, would be a candidate for excavation and treatment of soil.

Tar and oil wastes frequently contaminate groundwater at manufactured

gas sites, and the pumping and treatment method of groundwater remediation is the most commonly selected remedy for restoring contaminated aquifers. However, there is increasing recognition of the ineffectiveness of remediating groundwater to the stringent cleanup levels (e.g., drinking water standards) that are usually required at Superfund sites.[9] Although groundwater pumping and treatment can accomplish significant mass removal, there has been little success in reducing the contaminant concentrations to the target cleanup levels. Congress and the public's desire for restoring the quality of contaminated groundwater to its original state is on a collision course with physical reality and economic limits. It is likely that a current National Academy of Sciences study of the efficacy of groundwater pumping and treatment will raise the issue to greater public consciousness.

Remediation of manufactured gas sites is complicated by their age (often over one hundred years), a long time for contaminants to move off-site. Disposal practices were unpredictable and varied from facility to facility. In addition, site conditions vary, and techniques that work well on one site may fail at others. The detailed evaluation of manufactured gas site investigation and remediation strategies is beyond the scope of this article. However, diligent investigation into the history of the site and application of good engineering and scientific principles can help to identify appropriate restoration strategies.

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ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-002 - This request pertains to the level of environmental cleanup required at each MGP site.

a. For each MGP site, describe the level of environmental cleanup required.
b. List the steps that must be taken to obtain the level of environmental cleanup required.
c. Explain and evaluate any alternative levels of environmental cleanup that may be applicable for each site.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response:

The Company is managing its potential MGP liabilities under the Illinois Environmental Protection Agency's Site Remediation Program. The Illinois EPA reviews and approves work plans prior to the initiation of work. The Company conducts its activities on a risk-based priority level. The Company activities in 1999 included interim remedial measures and site stabilization work that was implemented in response to reduce potential risks. Schedule SDR-001.1 provides the steps that can be taken by the Company to reduce or eliminate risks to human health or to the environment. The Company's activities in 1999, as discussed above, were in response to incidents and releases into the environment and the level of response implemented in each case, in the opinion of Illinois EPA, was sufficient to mitigate the immediate risk.

a. The level of environmental cleanup required is determined on a case-by-case basis in cooperation with the IEPA, the affected community, and other concerned parties. Final determinations have not yet been made for the Company's MGP sites, other than Staunton (See Schedule SDR-003.1). The Company has implemented a series of "Interim Remedial Measures" to manage MGP contamination until the level of cleanup can be determined.

b. The steps that must be taken are described in Schedule SDR-001.1. These steps can be modified or eliminated based upon site-specific conditions.

c. Alternative levels of cleanup are evaluated on a site-specific basis. The Company intends to explore alternative levels of cleanup with the IEPA in an effort to achieve the required level of environmental of protection in a cost-effective manner.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-003 - Has the Company ever received a site remediation letter from the Illinois Environmental Protection Agency indicating that no further remediation is required at a specific MGP site? If yes, provide a copy of each site remediation letter received.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response: In 1993, the Company received a letter from the Illinois Environmental Protection Agency, pursuant to Section 4(y) of the Illinois Environmental Protection Act, wherein the Company was released from further responsibility for preventive or corrective action at the Company's Staunton MGP site (see Schedule SDR-003.1).

ST00118

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

2200 Churchill Road, Springfield, IL 62794-9276

(217) 782-6761

December 17, 1993

Barbara J. Irwin
Illinois Power
Environmental Affairs Department
500 South 27th Street
Decatur, Illinois 62525

Re: 1171050004--MaCoupin County
Staunton/Illinois Power Company
Superfund/Technical Reports

Dear Ms. Irwin:

The Illinois Environmental Protection Agency (Agency) received your November 24, 1993 and December 7, 1993 correspondence for the above referenced site.

Subject to Section 4(y) of the Illinois Environmental Protection Act, 415 Illinois Legislative Complied Statues 5/4(y), the Agency releases Illinois Power from further responsibility for preventive or corrective action at the above referenced site insofar as preventive or correction action appears to be successful and has been so demonstrated to the Agency's satisfaction.

If you have any question, please feel free to contact me through this office.

Sincerely,

John Sherrill
State Sites Unit
Remedial Project Management Section
Division of Remediation Management
Bureau of Land

JSS:jss

cc: Division File
Springfield Region
Stan Black, IEPA

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-004 - Describe how the Company monitors the actual on-site investigation and remediation activities.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response: The Company monitors on-site investigative and remedial activities in several ways:

- All budgets and project specifications are reviewed and approved before the contractor goes into the field.

- Any budget or scope changes that are required because of field conditions are evaluated and approved by the Company before they are implemented.

- Company personnel are at the site when the project begins, at critical project milestones, and periodically throughout the project. An IEPA representative is also present at the site during most field activities. Changes to the scope of work are discussed with the IEPA representative in the field. This immediate approval process minimizes contractor's standby charges and allows projects to be completed as expeditiously as possible.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-005 - This request pertains to the Company's forecasting of MGP environmental cleanup costs for the reconciliation period.

a. Explain the forecasting methods used by the Company to determine MGP environmental cleanup costs for the reconciliation period.

b. Describe how the forecasted cost numbers were determined.

c. Include explanations for each instance where the actual costs, by site or account code, deviated from the forecast costs by 10% or more.

d. Explain how these cost forecasts were used by the Company for the reconciliation period.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response:

a. The Company prepares an annual forecast of expenses. Expenses are estimated based on the expected level of investigation or remedial activity and current regulatory requirements. Each year, the status of its MGP obligations is modified according to experience, new information and changing regulations. The basis for the modification is the level of work expected to be completed in the subsequent year. Changes to the budget/planned activities may also change throughout the year based on new information.

b. Same as a.

c. For 1999, no deviations in project budgets were greater than 10% of the forecast costs.

d. These cost forecasts are used in conjunction with activity forecasts to arrive at the Company's annual MGP budget.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-006 - Provide a copy of all written procedures for MGP environmental cleanup, purchasing, and contracting that were in effect during the reconciliation period or that were in effect when past MGP environmental cleanup purchases and contracts were made that extended into the reconciliation period.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response: Schedule SDR-006.1 provides the current guidelines for the Purchasing and Material Control Department to follow and determine a procurement method to be utilized to minimize overall cost of possession. The contractors providing services in 1999 were obtained using this procedure. The primary consultant for these services was Philip Environmental.

In 1996, IP entered into an alliance contract with Philip Environmental Services, Inc. This alliance allows Philip to reduce overhead by dedicating staff, on a full-time basis, to IP's MGPs. Performance-based incentives and penalties reward the contractor for cost-reducing innovations and penalize the contractor for cost overruns.

As a result of the new contract, IP now pays lower rates for staff and equipment than it paid under the previous competitively bid contract. IP and Philip have the ability, under the Alliance contract, to renegotiate rates annually. The Alliance rates have not changed since 1996. The Alliance contract was tested in 1997 by bidding the Belleville MGP Interim Remedial Measures. Philip was the lowest bidder for that project.

Schedule SDR-006.1

ILLINOIS POWER

An Illinova Company

Bidding Requirements

Procedure Nbr.: PS3. 4
Exhibit/Attachment:
Rev Nbr.: Rev. 1
Rev Date: 05/18/99

PS 3.4
Rev. 1

May 18, 1999

SUBJECT: ORDERING
Bidding Requirements

PURPOSE:

Establish guidelines for the Purchasing/Material Control Department to follow to determine the procurement method to be used to minimize the overall cost of possession.

GENERAL:

It is the intent that, to the extent possible, all orders for supplies/services be awarded based on the lowest overall evaluated cost. Cost is intended to mean the overall cost of possession. It is not always possible for Purchasing and Material Control personnel to be aware of all incremental costs that constitute cost of possession; therefore, latitude to identify and justify these costs is granted to the requestor seeking procurement of supplies/services.

The cost of formal (traditional) procurement activities by Purchasing and Material Control may result in the overall cost of possession being greater than when procured/acquired through less formal channels as described herein. This procedure is intended to provide guidelines to be employed to minimize the overall cost of possession.

GUIDELINES:

There are instances when buyer's market knowledge and value of the purchase

make it prudent for the buyer to forgo a traditional written bid solicitation. This decision results from balancing the cost of procurement against the potential savings from formal competitive bids.

When the buyer possesses market knowledge and the cost of the total purchase is $500 or less, the buyer may award the order for supplies/services based on the buyer's knowledge that the price to be paid is reasonably competitive and that the cost to obtain bids would be greater than any potential savings.

There may be instances in which the buyer has previously investigated the market and retained "on file" the pricing information provided by various suppliers. In those instances the buyer may use those file prices to award an order for supplies/services to the lowest overall evaluated cost supplier so long as the total order value does not exceed $10,000.

When the cost of total purchase is greater than $500 but less than $10,000, the buyer may solicit an "appropriate number" of bids/proposals orally (telephone or in person), document those bids, and award the order based on the lowest overall evaluated cost.

When the cost of the total purchase is $10,000 or greater the buyer shall solicit an appropriate number of written bids/proposals and award the order based on the lowest overall evaluated cost.

No specified number of bids is required to be solicited. When the buyer accepts the responsibility to award the order, the buyer also accepts the responsibility to ascertain that the "solicitation" is sufficiently comprehensive (at least two bidders) to insure a true picture of the competitive status of the market relative to the supplies/services being purchased.

In all cases, the buyer must document in the purchase order file, the method used and the basis for the award.

The buyer shall employ more formal (stringent) procurement practices when required by the requestor or when the buyer deems it necessary and is prepared to be held accountable for the decision to use the more costly and time consuming formal/ stringent procurement practices.

EXCEPTIONS:

If the requisition is 1) accompanied by a sole source memo or notation; or 2) the supplies/services are available only from the original equipment manufacturer; or 3) the supplies/services are known (by the buyer) to be available only from a single source; multiple competitive bids are not required. If, in any of the above, the cost of the total purchase is greater than $10,000, the buyer may solicit the

bid orally and secure written confirmation of the oral proposal; if the cost is less than $10,000 written confirmation is not required.

Instances may arise in which the "need date" established by the requestor does not provide sufficient time for the buyer to employ the methods identified above. In those instances, the buyer is to contact the requestor and verify the need date in light of these bidding guidelines. If the user revises the need date to allow for the use of these guidelines, the buyer shall proceed accordingly. If the user confirms the need date, the buyer is to proceed to procure the supplies/services as expeditiously and prudently as possible while complying with the needs of the user.

In each of the above instances, the requestor accepts the responsibility to be held accountable to use their best judgement in making a recommendation.

Situations may occur whereby the requirements are of such a nature that the aforementioned methods may not be practical nor reasonable to:

- avoid or minimize risk of injury or death to persons
- avoid significant damage to property
- avoid service interruptions
- avoid excessive delays and expenses

In those instances, the buyer shall use best judgement to award the order **expeditiously and prudently** as dictated by the situation.

Approved by:

K. B. Leftwich
Vice President

Issued by:

P. E. Hoffman
Manager of Purchasing and Material Control

Category: Purchasing & Stores Procedures
SubCategory:Section 3 - Ordering

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-007 - Provide the date when the MGP environmental cleanup purchasing and contracting procedures were most recently changed, identify each procedure that was changed, and explain why each change was made.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response: The Purchasing and Material Control Bidding Requirements were changed November 5, 1992. The procedure change was a result of a reengineering of the Supply Service Process at the Company. The goal of this change was to allow personnel to respond more quickly to customer needs with minimal economic risk. A later version of these requirements was issued on May 12, 1993, when the Company placed its corporate procedures on the Company's computer network. There were no material changes to the bidding process from the earlier version to the May 12, 1993 procedure. These bidding requirements were subsequently revised on May 18, 1999 (Schedule SDR-006.1). No substantive changes to the bidding process were made, however, in 1999.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-008 - This request pertains to the general management evaluations, assessments, and/or reviews of the MGP environmental cleanup purchasing and contracting procedures.

a. Provide the date of the three most recent general management evaluations, assessments, and/or reviews of MGP environmental cleanup purchasing and contracting procedures.

b. Provide a copy of all reports and/or summaries of these general management evaluations, assessments, and/or reviews.

c. List and explain any changes or modifications made to the purchasing and contracting decision-making process as a result of these general management evaluations, assessments, and/or reviews.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response:

The company has no specific MGP environmental cleanup purchasing and contracting procedures. The Company's general purchasing and contracting procedures govern MGP purchasing and contracting:

a. The Company's procedures are evaluated on an as-needed basis. The last three evaluations resulted in revised corporate procedures attached as Schedule SDR-006.1. The May 18, 1999 procedure for bidding requirements is the most recent procedure. This procedure was in effect during 1999.

b. There are no reports or summaries of the general management evaluations, assessments and/or reviews. The revised procedures in Schedule SDR-006.1 are the outcomes of such reviews.

c. Purchasing and contracting procedures are modified based on management review of current practices to minimize cost and provide a more efficient bidding/contracting process.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-009 - Explain how purchasing and contracting decisions for MGP environmental cleanup costs were included in the corporate planning and budgeting process during the reconciliation period.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Revised Response: The Company's MGP environmental management plan is based on collective knowledge of Company staff and consultants. The plan is revised periodically to reflect the results of remedial activities, as well as current remedial practices and applicable, current and relevant governmental regulations. Company staff and Philip Environmental have investigated most of the Company's MGP sites and possess institutional knowledge of these sites. This familiarity with specific site conditions enhances the Company's ability to apply direct and creative solutions to the sites. Philip Environmental has been involved at various levels in the Company's MGP program since 1987 and non-MGP hydrogeological studies since 1981. This has provided the Company with a smooth work flow, reduction in lost time and avoidance of possible liability inherent in using a new contractor. This has also allowed for a good working relationship based on trust and mutual objectives of cost reduction and innovation.

To assure that the Company receives the best and least-cost approach to its business, the Company annually negotiates rates with Philip. The criteria for these negotiations are:

- Hold any price increase to an inflation adjustment.
- Take advantage of favorable market conditions or other factors that will reduce cost.
- Review unsolicited proposals from other vendors to compare rates and approaches.

Rates under the IP/Philip Alliance contract have not changed since 1996. Philip also won the competitively bid contract for the Interim Remedial Measures at the Belleville MGP in 1997.

*Baldwin Thermal Treatment was forced to stop accepting waste in 1999 due to factors associated with a switch to low-sulfur coal as a fuel source for the Baldwin Power Station. This required the Company to suspend the excavation of waste from its MGP sites until an acceptable disposal alternative could be found. The Sonas facility, near Phoenix, Arizona was selected as an acceptable alternative, however, because excavation activities had been suspended, no waste was sent to that facility during the reconciliation period.

* Asterisk indicates change

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-010 - This request pertains to the Company's procedures for MGP environmental cleanup purchasing and contracting decisions.

a. Identify the management level at which purchasing and contracting decisions for MGP environmental cleanup costs were made during the reconciliation period.

b. If different procedures were applied at progressively higher cost amounts, describe in detail the procedures for each of the cost amounts.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response:

a. The Senior Environmental Professional – Environmental Health, Safety and Training is responsible for purchasing and contracting decisions for MGP remedial management costs up to $50,000. Based on the level of expenditure, higher management level approval may be required.

b. Schedule SDR-010.1 details the procedure for approvals based on the level of cost.

Authority to Approve Company Transactions

Procedure Nbr.:	GP1. 2
Exhibit/Attachment:	
Rev Nbr.:	Rev. 0
Rev Date:	11/15/93

GENERAL

PROCEDURE

GP 1.2, Revision 0

November 15, 1993

AUTHORITY TO APPROVE COMPANY TRANSACTIONS

Reviewed by:

Larry F. Altenbaumer
Senior Vice President and Chief Financial Officer

Approved by:

Larry D. Haab, Chairman, President and Chief Executive Officer

(This procedure is being reissued in a new format only. No changes made to the text.)

TITLE: AUTHORITY TO APPROVE COMPANY TRANSACTIONS

PURPOSE/SCOPE

The purpose of this procedure is to improve productivity by delegating authority to execute corporate instruments or approve other transactions to the lowest acceptable management level with responsibility for the transaction. This procedure identifies positions that are delegated authority, assigned responsibility and held accountable for the transaction. The procedure allows delegations of authority to positions other than those named and for reduction in authority levels for special business reasons.

Persons exercising authority under this procedure are responsible for the transaction and for determining that an appropriate investigation or appropriate procedures provide reasonable assurance as to the propriety of the transactions. The delegation of authority does not exempt an employee from complying with Company policies and procedures for the proper documentation and processing of a transaction.

DEFINITIONS

AUTHORIZED APPROVER - An employee authorized to approve certain Company actions, specified levels of expenditure and external financial communications, as defined herein.

AUTHORIZED APPROVERS FILE - Files containing the facsimile signatures or electronic approval codes of Authorized Approvers.

MINIMUM APPROVALS - The minimum permissible approvals. The highest designated Authorized Approver may seek additional substantiation and evaluation from other qualified persons, although such practice will be considered an exception.

TEMPORARY AUTHORIZED APPROVER - An employee may be designated a Temporary Authorized Approver if that individual will be acting for the normal Authorized Approver for more than sixty (60) days. Temporary authorizations and a facsimile signature of the Temporary Approver shall be furnished to the Supervisor of any area involved in processing documents likely to be approved by the Temporary Authorized Approver. Normally, the next higher level of Authorized Approver will approve transactions when the Authorized Approver is unavailable for a short duration.

RESPONSIBILITIES

The Controller shall provide interpretation of the requirements of this procedure.

Accounts Payable shall maintain an Authorized Approvers File. Accounts Payable shall ensure that other departments shall have reasonable access to the Authorized Approvers File.

Authorized Approvers shall satisfy themselves that the action proposed for their approval is consistent with laws and Company policies and procedures.

Employees shall take necessary steps to satisfy themselves that approval has been obtained prior to conducting work or acting in accordance with forms or documents requiring authorization.

Supervisors shall advise their personnel of the approval requirements contained herein and ensure that they are fulfilled. Authorized Approvers and Temporary Authorized Approvers shall be held accountable for making prudent informed decisions.

PROCEDURE

Transactions requiring approval and the lowest authorized to approve the transactions are shown in Exhibit 1. Documents shall normally be approved and executed by signature of the lowest level Authorized Approver. Signature of the requestor and the Authorized Approver(s) shall constitute full and complete approval.

The general and specific approval levels shown in Exhibit 1 are the minimum required approval levels. All employees above the level shown may also approve the indicated documents and transactions.

Requests for approval authority for positions not specified in this procedure, additional authority for a specific position or restrictions of a specific position's approval to lower levels than specified in this procedure shall be sent in writing to the Controller. Requests must evaluate risks versus business needs for the requested authority level and be approved by an officer. Authority levels shall be requested for specific positions, not for specific individuals.

Approvals shall follow the direct lines of organizational authority whenever possible. In all instances, the officer having the authority over an area originating a disbursement document has the authority to approve the document. Any questionable disbursement transaction shall be brought to the attention of the officer having authority over the approving employee and to the Controller.

Approved original contracts (except purchase orders) shall be transferred to Corporate Records Management for retention in the Company records. Disapproved documents shall be promptly returned to the originating organization with an explanation of the reason for disapproval.

In the absence of the individual with designated approval level, authority to approve move to the next higher approval level. In the absence of all authorized employees, including the officer having line authority over the area originating a disbursement document, the Controller or Chief Financial Officer may give approval. If an Authorized Approver is scheduled to be absent for more than sixty (60) days, a Temporary Authorized Approver may be designated by the individual with the next higher approval level. Such designation is accomplished by the sending a Delegation of Authority Due to Extended Absence memorandum to the Controller, with a copy to Accounts Payable.

Any deviation from this General Procedure shall be brought to the attention of the Controller

and receive written approval of the officer having authority over the approving employee prior to it implementation.

Time sheets, payroll, vacation schedules, pool car requests, training requests, transportation requests and other routine and daily documents shall be approved at the lowest level possible consistent with good management practice.

No employee is authorized to approve a transaction which could be expected to accrue to the benefit of the employee. Any transaction which provides an employee with personal profit or may be approved by an elected officer and reported in accordance with Company policy.

EXHIBITS

Exhibit 1, Authorized Approval Levels, specifies the lowest acceptable approval level for Company documents and transactions.

.....

Category: General Procedures
SubCategory: General Procedures

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-011 - This request pertains to the Company's notification to potential suppliers of goods and services of the Company's intent to purchase or contract goods and services for the environmental cleanup of MGP sites.

a. Identify all procedures used by the Company to ensure that every reasonable effort was made to notify all available suppliers of the goods and services required for the environmental cleanup of MGP sites before new purchases were made, or before new contracts were awarded to a supplier during the reconciliation period.

b. Describe all related actions taken by the Company before any new purchases were made or before any new contracts were awarded during the reconciliation period.

c. Describe the instances when only one supplier was notified, and explain how costs were thus minimized.

d. Identify all instances when the lowest bid for goods and services required for the environmental cleanup of MGP sites was rejected, and explain the reasons for the rejection.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Revised Response:

a. During the 1999 reconciliation period, IP continued to use Philip Environmental as its main MGP contractor based on the 1996 Alliance Contract. This was based on Philip's continued successful performance and rates at or below other comparable firms. The alliance includes incentives and penalties based on predetermined performance goals. These incentives and penalties allow Philip to become a stakeholder in the project and encourage the contractor to find innovative methods of cost reduction.

The new alliance contract, signed in 1996, reduced Philip's rates for labor and equipment below the previous competitively bid contract rates. The alliance was tested in 1997 by competitively bidding the Interim Remedial Measures at the Belleville site. Philip was the low bidder for the Belleville Interim Remedial Measures. Philip's unit rates have not changed since 1996.

b. *Baldwin Thermal Treatment was forced to stop accepting waste in 1999 due to factors associated with a switch to low-sulfur coal as a fuel source for the Baldwin Power Station. This required the Company to suspend the excavation of waste from its MGP sites until an acceptable disposal alternative could be found. The Sonas facility, near Phoenix, Arizona was selected as an acceptable alternative, however, because excavation activities had been suspended, no waste was sent to that facility during the reconciliation period. The Company is continuing to search for acceptable disposal alternatives in an effort to minimize transportation and disposal costs.

c. See a.

d. In 1999, no instances occurred in which the lowest bid for goods and services was rejected.

* Asterisk indicates change

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-012 - Explain how the Company evaluated each contract renegotiation position that was proffered by a contracted supplier of the goods and services required for the environmental cleanup of MGP sites during the reconciliation period.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Revised Response: The response to SDR-009 provides the Company's renegotiation criteria. In addition, the Company reevaluated the scope of services during review of the Alliance contract with Philip to determine if there were opportunities to reduce or expand the scope to realize cost reduction. Based on this review, the Philip agreed to no rate increase for 1999. Philip also agreed to expand the number staff eligible for dedicated rates, resulting in lower labor cost for IP.

*Baldwin Thermal Treatment was forced to stop accepting waste in 1999 due to factors associated with a switch to low-sulfur coal as a fuel source for the Baldwin Power Station. As a result, the Company had to find an alternative disposal facility for MGP wastes. The Sonas facility, near Phoenix, Arizona was chosen based on its ability to meet the required treatment standards associated with the Land Disposal Restrictions under the Resource Conservation and Recovery Act, price and associated transportation costs. No waste was sent to Sonas during the reconciliation period.

* Asterisk indicates change

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-013 - Explain how the Company formulated each contract renegotiation position that it offered to a contracted supplier of the goods and services required for the environmental cleanup of MGP sites during the reconciliation period.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response: The Company's contract renegotiation positions for contractors were based on the Company's objectives as outlined in the response to SDR-009, MGP experience and market conditions in the consulting industry. Competitive bids are used occasionally (see response to SDR-011) to assure that the Company is paying the best possible rates. In addition, unsolicited proposals and qualifications packages are evaluated when possible to compare against the Company's current arrangement.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-014 - This request pertains to the Company's monitoring of MGP environmental cleanup purchase and contracts.

a. Explain how the Company monitored MGP environmental cleanup purchases and contracts during the reconciliation period.

b. Document all changes made as a result of these monitoring efforts.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Revised Response: The Company has procedures in place as described in the response to SDR-004 to ensure the quality of goods and services purchased. Furthermore, contracting procedures described in responses to SDRs-006, 007, and 010 guide the management of environmental cleanup purchases and contracts. Company staff monitor field activities to confirm that a project's contractual scope-of-work is completed. After products or services are provided, Company staff reviews detailed invoices from the providers before final approval.

*Baldwin Thermal Treatment was forced to stop accepting waste in 1999 due to factors associated with a switch to low-sulfur coal as a fuel source for the Baldwin Power Station. This required the Company to suspend the excavation of waste from its MGP sites until an acceptable disposal alternative could be found. The Sonas facility, near Phoenix, Arizona was selected as an acceptable alternative. Because excavation activities had been suspended, no waste was sent to that facility during the reconciliation period. The Company is continuing to search for acceptable disposal alternatives in an effort to minimize transportation and disposal costs.

* Asterisk indicates change

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-015 - Identify and explain any factors which limited the Company's available purchasing and contracting options for the goods and services required for the environmental cleanup of MGP sites during the reconciliation period.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Revised Response: *Baldwin Thermal Treatment was forced to stop accepting waste in 1999 due to factors associated with a switch to low-sulfur coal as a fuel source for the Baldwin Power Station. This required the Company to suspend the excavation of waste from its MGP sites until an acceptable disposal alternative could be found. The Sonas facility, near Phoenix, Arizona was selected as an acceptable alternative, however, because excavation activities had been suspended, no waste was sent to that facility during the reconciliation period. The Company is continuing to search for acceptable disposal alternatives in an effort to minimize transportation and disposal costs.

* Asterisk indicates change

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-016 - Identify and explain all efforts that the Company made during the reconciliation period to take advantage of favorable market conditions to renegotiate its contracts or to purchase from alternative market sources the goods and services required for the environmental cleanup of MGP sites. If no contract renegotiations were attempted, explain why not.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Revised Response: See responses to SDR-006, 009, 011, 012, and 018.

*Baldwin Thermal Treatment was forced to stop accepting waste in 1999 due to factors associated with a switch to low-sulfur coal as a fuel source for the Baldwin Power Station. This required the Company to suspend the excavation of waste from its MGP sites until an acceptable disposal alternative could be found. The Sonas facility, near Phoenix, Arizona was selected as an acceptable alternative, however, because excavation activities had been suspended, no waste was sent to that facility during the reconciliation period. The Company is continuing to search for acceptable disposal alternatives in an effort to minimize transportation and disposal costs.

* Asterisk indicates change

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-017 - This request pertains to any occurrences when the Company made purchases or entered into contracts using criteria other than minimizing the cost of the environmental cleanup of MGP sites.

a. List any occurrences during the reconciliation period when the Company made purchases or entered into contracts using criteria other than minimizing the cost of the environmental cleanup of MGP sites.

b. For each occurrence, explain the circumstances, quantify the extra costs incurred, and explain what, if anything, can be done to prevent extra costs of this type from being incurred in the future.

c. Provide all documentation pertaining to each occurrence.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response:

a. The Company did not enter into any contracts in 1999 that were based on criteria other than minimizing the cost of the environmental cleanup of MGP sites.

b. Not applicable.

c. Not applicable.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-018 - This request pertains to the Company's procedures to minimize MGP environmental cleanup costs.

a. Explain with specificity the procedures used by the Company to minimize MGP environmental cleanup costs.

b. Give a detailed description of these procedures as they related to all purchasing and contracting decisions for MGP environmental cleanup costs made during the reconciliation period.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response: The Company strives to minimize costs in several ways:

- Contractor rates are evaluated and renegotiated on an annual basis. IEPA is consulted during project evaluations to identify acceptable remedial alternatives. Note that IEPA does not participate in cost decisions, but they determine the acceptability of the various remedial alternatives that will achieve the appropriate risk reduction. It is then left to the Company to choose the alternative that meets the risk reduction goal for the lowest cost.

- The Company participates in state and federal legislative initiatives that affect MGPs. For instance, the Company was heavily involved in the development of the State's new Tiered Approach to Corrective Action Objectives (TACO) regulations. These new regulations employ a risk-based approach to environmental contamination and have the potential to greatly reduce the costs of remediation.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-019 - This request pertains to the Company's after-the-fact evaluations of its purchasing and contracting decisions for MGP environmental cleanup costs.

a. How often are after-the-fact evaluations conducted by the Company to review its purchasing and contracting decisions for MGP Environmental cleanup costs?

b. Provide a copy of all documents pertaining to these evaluations.

c. Identify any decisions, recommendations, policy changes, and new procedures that have resulted from these evaluations.

d. Provide the date when the three most recent after-the-fact evaluations were conducted and provide copies of those reports.

e. List and explain any changes or modifications made to the purchasing and contracting decision-making process as a result of the after-the-fact evaluations.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response:

a. No specific after-the-fact evaluations are made of purchasing and contracting decisions. Any concerns associated with a specific purchase or contract are addressed immediately, as explained in the response to SDR-004 and SDR-022. Any concerns relative to a specific purchase or contract are addressed in annual renegotiations as described in the response to SDR-012 and SDR-013.

b. Not applicable.

c. Not applicable.

d. Not applicable.

e. Not applicable.

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ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-020 - This request pertains to the Company's audits of its purchasing and contracting decisions for MGP environmental cleanup costs.

a. How often are the MGP environmental cleanup purchasing and contracting functions audited by management using internal or external auditors?

b. Provide the dates when the three most recent audits were conducted and provide copies of those audit reports.

c. List and explain any changes or modifications made to the purchasing and contracting decision-making process as a result of these audits.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response: The Company has not conducted formal audits of its purchasing and contracting decisions for MGP environmental cleanup costs.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-021 - Explain the procedures used to verify the quality of the items and services purchased or contracted for regarding the environmental cleanup of MGP sites.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response:
The Environmental Resource Department of Illinois Power Company (Company) is responsible for conducting Environmental Audits of external companies that could potentially constitute environmental risk to the Company. These companies may include:

- Recyclers
- Hazardous Waste Treatment, Storage, and Disposal Companies
- Sanitary and Hazardous Waste Landfills
- Laboratories
- Used Oil Brokers
- Scrap Metal Dealers
- Remediation Contractors and
- Waste Haulers

See response to SDR-004 for additional detail.

ILLINOIS POWER COMPANY
ILLINOIS COMMERCE COMMISSION
DOCKET NO. 00-0439
DATA REQUEST

Request Number: SDR-022 - This request pertains to the policies and procedures for the quality control of items and services purchased or contracted for regarding the environmental cleanup of MGP sites.

a. What are the Company's policies and procedures for dealing with items and services purchased or contracted for regarding the environmental cleanup of MGP sites which failed to meet quality and contract specifications?

b. List each occurrence when items and services purchased or contracted for regarding the environmental cleanup of MGP sites failed to meet quality and contract specifications.

c. Provide documentation of any related actions taken by the Company during the reconciliation period. If no documentation can be provided, explain why not.

Response Prepared By: Brian H. Martin
Senior Environmental Professional
217/424-7525

Response:

a. Items and services that do not meet the quality and contract specifications are rejected. No payment is made for rejected items or services. The oversight procedures as outlined in SDR-004 serve as quality control.

b. In 1999, Philip changes in personnel resulted in field activities taking more time than allowed in the original budgets for the Belleville and Champaign MGPs. The extra time was required because of the new employees' unfamiliarity with the sites. The extra labor charges were not billed to IP.

In 1999, Philip collected samples from the Cairo MGP site, but they used inappropriate sampling methods and sampled an incorrect monitoring well by mistake. Philip reported the errors to IP and recollected the samples and paid for the necessary lab analysis on the correct samples.

In 1999, Philip did not have all necessary tools on their service truck at the beginning of a sampling project at the Centralia MGP, resulting in a one-day delay of the field project. The correct tools were delivered at Philip's expense and the extra day was not billed to IP.

In 1999, air monitoring equipment malfunctioned during the Interim Remedial Measures at the Decatur MGP, forcing site activities to be stopped for two days. Standby charges were not billed to IP for the delay.

c. No documentation of rejected services is available because the Company was never charged for rejected services.